DOCUMENT RESUME

ED 253 185 HE 018 094

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TITLE A University-Based Incentive Program to Increase Safety Belt Use: Toward Cost Effective Institutionalization.
PUB DATE [84]
NOTE 37p.; Paper presented at the Annual Meeting of the American Psychological Association (92nd, Toronto, Canada, August 24-28, 1984). Master's Thesis, Virginia Polytechnic Institute and State University.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Descriptive (141) -- Dissertations/Theses - Master Theses (042)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Higher Education; *Incentives; Intervention; *Motivation Techniques; *Motor Vehicles; *Rewards; School Safety; *Security Personnel; State Universities; *Traffic Safety
IDENTIFIERS *Seat Belts; Virginia Polytechnic Inst and State Univ

ABSTRACT

An incentive program to increase safety belt use was implemented at a large university and was delivered by the campus police during the 1983-1984 academic year. For each of the intervention periods during three academic quarters, the 23 regular police officers recorded the license numbers of vehicles with drivers wearing a shoulder belt, and each week 10 raffle winners were drawn from these numbers. Winners received gift certificates donated by community merchants. For faculty, staff, and students, usage increased from a fall baseline mean of 17 percent to 26 percent during spring. Belt usage for non-university-affiliated drivers increased to a lesser extent. A cost-effectiveness analysis indicated that the seatbelt sweepstakes cost an average of 98 cents per each newly-buckled driver and the program interfered only slightly with officers' ongoing duties. A telephone survey suggested that attitudes toward campus police did not change significantly as a function of the sweepstakes, although an officer post-program questionnaire indicated that the officers felt the students were responding in a more positive manner toward them specifically as a result of the sweepstakes. Program promotion and coordination was eventually taken over by two student organizations. (Author/SW)

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A UNIVERSITY-BASED INCENTIVE PROGRAM TO INCREASE SAFETY BELT USE: TOWARD COST EFFECTIVE INSTITUTIONALIZATION

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Master's Thesis

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HE 018 094

Abstract

A large scale incentive program to increase safety belt use was implemented at a large university and was delivered by the campus police during the academic year 1983/1984. For each of the intervention periods during the three academic quarters, the 23 regular police officers recorded the license numbers of vehicles with drivers wearing a shoulder belt, and each week ten raffle winners were drawn from these numbers. Winners received gift certificates donated by community merchants. For those drivers affiliated with the university (i.e., faculty, staff, and students), usage increased from a Fall Baseline mean of 17% to 26% during Spring Withdrawal. Belt usage for non-affiliated drivers increased to a lesser extent, from a pre-program mean of 16% to a Spring Withdrawal mean of 22%.

A cost-effectiveness analysis indicated that the Sweepstakes cost an average of $ .98 per each newly buckled driver and the program interfered only slightly with officers' ongoing duties. A telephone survey suggested that opinions toward campus police did not change significantly as a function of the Seatbelt Sweepstakes, although an officer post-program questionnaire indicated that the officers felt the students were responding in a more positive manner toward them specifically as a result of the Sweepstakes. Program promotion and coordination was eventually taken over by two student organizations, with plans currently underway to continue the program into the 1984/1985 academic year.

A University-Based Incentive Program to Increase Safety Belt Use: Toward Cost Effective Institutionalization

One of the most critical problems facing society today is the tremendous risk on the nation's highways. More than 45,000 deaths and 500,000 injuries occur each year to occupants of motor vehicles (Bigelow, 1982); and vehicle accidents are the leading cause of fatalities to U.S. children and young adults ("Accident Facts," 1981). This is certainly one of the greatest tragedies of our society; but even more tragic is the fact that only about 15% of the vehicle occupants in the U.S. wear a safety belt which could reduce the chance of death and serious injury from a vehicle accident by 55 percent or more (*Federal Register*, 1983). On the Virginia Tech campus (the site of the present study) over 250 accidents occurred during academic year 1983/1984, with 41 resulting in injuries serious enough to warrant emergency medical care (*Virginia Tech Police Department Records*, 1984).

In 1981, the U.S. National Highway Traffic Safety Administration (NHTSA) launched a nationwide effort to increase safety be[illegible]usage, and this campaign has been enhanced considerably with large-sc[illegible] applications of incentive strategies (Bigelow, 1982). Several research projects have documented the beneficial impact of safety belt incentives in a variety of environmental settings, including industries (Campbell, Hunter, Stewart, & Stutts, 1982; Geller, 1982; Geller & Hahn, 1984), shopping malls (Elman & Killebrew, 1978), high schools (Campbell, Hunter, Stewart, & Stutts, 1982), and banks (Geller, Johnson, & Pelton, 1982; Johnson & Geller, 1984).

The results of these studies prompted NHTSA to promote the implementation of communitywide incentive programs for safety belt promotion. For example, NHTSA recently sponsored community-based incentive programs in six cities (i.e., Dover, NJ, Fresno, CA; Kalamazoo, MI; Natchitoches, LA; San Antonio, TX; and Suffolk County, NY) whereby vehicles were approached

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at intersections and occupants wearing safety belts were offered rewards donated by community merchants (Geller, 1984). Similar community incentive programs have been implemented in Chapel Hill, NC (Campbell, Hunter, & Gemming, 1983), Helena, MT (A. Goke, personal communication with the second author, November, 1983), and Jacksonville, MS (Long, 1983).

These attempts at motivating safety belt use in the community have largely been implemented by research groups and funded by federal and state grants. Such demonstration projects have shown substantial communitywide increases in safety belt use, but the interventions have been short-term and costly. For example, the program in Chapel Hill cost well over $30,000 for the incentives during a six-month intervention, and the federal government spent $82,000 in Natchitoches, LA to hire people to stand at the town's 23 traffic lights and pass out prizes (U.S. is Trying Safety 'Bribes,' 1983). Given only transient impact of most short-term incentive programs for safety belt promotion (e.g., see review by Geller, 1984), community-based safety belt programs should attempt to obtain institutionalization of incentive schemes by encouraging the indigenous businesses, institutions, and social groups of a community to initiate and continue program efforts. This was a prime consideration in the present study.

For all of the community-based programs implemented so far, those who observed drivers' shoulder belt usage for evaluation purposes were also those individuals who delivered the rewards (Geller, 1984). Thus, these observer/reward administrators could have served as discriminative stimuli for some motorists to buckle up, and this was in fact observed by some researchers (e.g., Campbell et al., 1983). In other words, when observers were recording usage during the incentive phase, it was probable that usage figures were inflated because some motorists buckled up just prior to passing

the obtrusive observer in order to receive a prize. As reviewed by Geller (1984), several studies of belt wearing at industrial sites have shown this "observer bias" to increase safety belt wearing. The present research addressed this evaluation problem by using observers who were unobtrusive and independent of those delivering rewards for safety belt use.

The police department is one service agency which may reap immediate payoffs for being the delivery agents for a community incentive program. Tactics to improve community relations between police officers and citizens are sorely needed and improved community relations have long been a goal of law enforcement agencies nationwide (Harris, 1982). By designating police officers as the delivery agents of an incentive-based safety belt campaign, it was hypothesized that not only would safety belt usage increase, but citizens would perceive the incentive strategy as a genuine show of community concern by police officers. This study documented an attempt to investigate the efficacy of a university-based safety belt program which was implemented and maintained by an organization indigenous to the community (i.e., the campus police department), and was evaluated independently by a research staff. Unlike previous studies in this research domain, the evaluation included a detailed analysis of cost effectiveness and adopted an ecological perspective (e.g., Geller, in press; Willems, 1977) by collecting data on behaviors and opinions which could have been indirectly influenced by the incentive scheme.

Method

Participants and Setting

The study was conducted on the campus of Virginia Polytechnic Institute and State University (Virginia Tech) during the Fall, Winter, and Spring academic quarters of 1983-84. During the project period, Virginia Tech, located in Blacksburg, VA (pop. = 30,000), had an enrollment of 21,357

students, employed 2,033 faculty and 3,267 staff, and issued vehicle parking stickers to approximately 5,200 faculty/staff drivers and 18,300 students. Although the study was aimed primarily at the Virginia Tech community, any vehicle driver who traversed the Virginia Tech campus was a potential participant.

Eighteen different locations (six per quarter) around the Virginia Tech campus were selected as observation sites. Vehicles were observed six days a week, Monday through Saturday. On each of these days a different observation site was chosen as the data collection point. These observation sites were rotated according to a Latin Square, such that each site fell on a different day of the week for each six-week period. Observation sessions occurred daily from 8:00 a.m. to 9:00 a.m., 4:00 p.m. to 5:00 p.m., and 8:00 p.m. to 9:00 p.m.

General Observation Procedure

As vehicles passed an observation site, two observers independently verbalized into a hand held microphone the vehicle license plate number, shoulder belt availability, and whether the driver was wearing a shoulder belt. If the vehicle had a Virginia Tech parking sticker, the color of the sticker was also noted. Police cars were noted separately. The two observers stood far enough away from each other so as not to interfere with the other's data collection. There was no attempt to observe every vehicle that passed an observation site. After completing the data recording of a particular vehicle, the observer looked up and targeted the next available vehicle. Occasionally, communication occurred between the two observers in order to ensure that at least one-third of the vehicles were being observed by both observers.

Experimental Conditions

Fall Baseline. The two observers stood on the sidewalk of the observation site and as inconspicuously as possible, recorded vehicle and occupant data. Although the observers were visible to vehicle occupants, at no time during the study was it made public that the observers were collecting data on safety belt usage. When observers were asked what they were doing, they replied that they were taking an "automobile survey for a research grant." If the pedestrian or driver questioned further they were given the office address of the second author. Such field observations occurred for 31 consecutive weekdays and nights (i.e., excluding Sundays). During the last three days of Fall Baseline, promotional tickets were placed under the windshield wipers of automobiles to announce the upcoming intervention phase.

Fall Intervention. Through a variety of promotional schemes (e.g., news releases, flyers, posters) implemented by research assistants and the Virginia Tech Police, the faculty, students, and staff of Virginia Tech and residents of Blacksburg and the surrounding area were made aware of the "Virginia Tech Police Department's Seatbelt Sweepstakes 1."[1]

Insert Figure 1 about here

Specifically, it was announced that beginning November 1st (the first day of the intervention), Virginia Tech Police would record the license plate numbers of drivers they saw wearing their shoulder belts. Figure 1 is a reduction of the 9" x 14" poster used to promote Seatbelt Sweepstakes 1. The posters for subsequent Sweepstakes included logos of student organizations who assisted in the promotion and coordination of the program.

For three one-week periods, the 22 regular officers across three work shifts recorded license plate numbers of those drivers wearing shoulder belts. At the end of each intervention week, the week's license plate numbers were entered into a raffle conducted by the Police Chief and a prominent university official (e.g., university president, college dean, student body president, editor of the school newspaper). Ten winners were picked weekly and winners chose prize packages valued from $20 to $450 which had been solicited by research assistants from local merchants. The Virginia Tech Police, using a Virginia Division of Motor Vehicles computer link-up, matched winning license plate numbers with area names. Those officers who submitted the *winning* license numbers were offered dinners-for-two donated by local restaurants. This strategy was faded out during the course of the study, and during the third intervention period, officer incentives were not offered. The observation procedure was the same as that followed during Baseline.

Fall Withdrawal. The Withdrawal period began the Monday following the last intervention week. Most of the promotional material used in the intervention phase had announced the date for the discontinuation of Seatbelt Sweepstakes 1. Observers recorded vehicle and occupant data in the same manner as described for Fall Baseline and continued for 18 consecutive weekdays (excluding Sundays).

Winter Baseline. Baseline data collection for the Winter Quarter began 27 days after the discontinuation of the Withdrawal period of the Fall term, and occurred for 17 consecutive weekdays. Four days before the end of the Baseline condition, promotional efforts similar to those used in the Fall were initiated to announce the kickoff of the next intervention phase.

Winter Intervention. As for the Fall intervention, individuals were informed through a variety of promotional schemes that they were entered into

"Seatbelt Sweepstakes 2" when being 'caught buckled up" by the Virginia Tech Police. The three drawings were identical to those described for Sweepstakes 1, with ten winners choosing prize packages donated by local merchants and the Virginia Tech Police that ranged in value from $20 to $120. During Winter Quarter, the distribution of promotional materials and solicitation of area merchants for prizes was handled by a volunteer student service organization (i.e., Circle-K, the student affiliate of the Kiwanis Club) with the occasional assistance of research assistants.

The observation procedures were the same as those followed during Winter Baseline with one alteration in the data collection schedule. Specifically, data were collected either for the morning and afternoon sessions for each day or for the evening session alone for that day, but data were never collected for all three time periods of one day. This intermittent data collection system began on the ninth day of Sweepstakes 2 and continued throughout the remainder of the study.

Winter Withdrawal. The Withdrawal period began the Monday following the discontinuation of Sweepstakes 2 and ran for 24 consecutive weekdays. Observers continued to record vehicle and occupant data as described previously for Fall Baseline.

Spring Baseline. Baseline data collection for the Spring Quarter began 18 days after the discontinuation of Winter Withdrawal and continued for 23 weekdays. Three days before the end of this condition, promotional efforts were begun to announce the kickoff of the next intervention phase.

Spring Intervention. The implementation and promotion of "Seatbelt Sweepstakes 3" occurred in the same fashion described previously, with ten winners per each of three weeks choosing prize packages valued from $20 to $180. The observation procedures were the same as those described

previously and continued for 18 weekdays (excluding Sundays). Poster distribution and merchant solicitation were handled entirely by two student service organizations (Circle-K and the Consumer Interest Organization).

Spring Withdrawal. This Withdrawal period began the weekday following the discontinuation of Sweepstakes 3 and ran for 12 consecutive days.

Cost Effectiveness

A cost effectiveness analysis was conducted which included the recording of all *direct* costs incurred during program promotion and implementation. This analysis focused on two aspects: a) the computation of program expenses, and b) the estimated average program cost per newly buckled driver per Quarter and over the entire academic year (i.e., from Fall Baseline to Spring Withdrawal).

Telephone Surveys

To assess students' attitude change toward the Virginia Tech Police, a telephone survey was developed and randomly administered.[2] For each quarter the telephoning occurred over the course of three, one-week time periods: during the second week of Baseline, during the second week of each Sweepstakes, and during the second week of each Withdrawal. During the same time periods, these telephone interviews were administered to students at a nearby college (i.e., Radford University, enrollment = 6,285). Using Likert-type, seven-point scales, students were asked their opinions regarding the value and competency of the police. Beginning in November (during Sweepstakes 1) and during all subsequent interviews, students were also asked if they had heard of the Seatbelt Sweepstakes and how they had heard of it.

Police Questionnaire

At the end of each quarter (i.e., during each Withdrawal period),

questionnaires with Likert-type, seven-point scales were administered to all regular police officers in order to assess the officers' feelings of involvement and satisfaction with the Seatbelt Sweepstakes. In addition, officers were asked to rate the feasibility of the program and to offer suggestions for improvements.[3]

Parking and Moving Citations

The daily numbers of parking and moving violation citations issued prior to, during, and after each of the Sweepstakes were compared.

Raffle Entries

The frequency of license plate numbers entered in each raffle was recorded as a measure of officer involvement in each Sweepstakes.

Results

Interobserver Reliability

Independent data recordings were made for 26,763 (35.0%) of the 76,504 vehicles observed. Rater agreement percentages were calculated separately for occurrences and nonoccurrences of the target behavior, and were calculated by dividing the total number of observations agreed upon for a particular data category by the total number of agreements and disagreements and multiplying by 100. The percent of agreement for shoulder belt availability was 96.1%; while agreement for the non-availability of a shoulder belt was 63.3%. Interobserver agreement for the target response (i.e, shculder belt used) was 82.6%; while interobserver agreement for the target response of shoulder belt not used was 95.1%.

Shoulder Belt Usage

Figure 2 shows the daily percentages of shoulder belt use for all drivers observed during the Fall, Winter, and Spring Quarters. Each data point in Figure 2 represents a mean of 422 observations (range = 82 - 883), with the

176 data points representing a total of 76,504 observations.

Insert Figure 2 about here

A straight line was fitted through the data by the method of least squares best unbiased estimate. The Durbin-Watson *d* statistic (Durbin & Watson, 1951) showed an absence of autocorrelation ($d = 1.71$, $p > .05$), and a regression analysis indicated that shoulder belt usage increased significantly over the course of the nine-month study, $F(1,174)=16.16$, $p < .0001$. Specifically, usage increased from a Fall Baseline rate of 16.6% to a Spring Withdrawal mean usage percentage of 24.3%.

Since an autocorrelation check for white noise (Box & Jenkins, 1976), was not significant, $X^2(18, N=176) = 20.78$, $p = .29$, an analysis of variance (ANOVA) was performed. The 3 Quarter (Fall vs. Winter vs. Spring) x 3 Condition (Baseline vs. Intervention vs. Withdrawal) factorial showed a main effect for experimental condition, $F(2, 167)=28.16$, $p < .0001$, indicating that drivers were most likely to buckle up during the Sweepstakes intervention ($M = 24.1\%$) compared to Baseline ($M = 18.7\%$) and Withdrawal ($M = 22.0\%$). A significant interaction was found for Quarter X Experimental Condition $F(4, 167) = 3.15$, $p < .05$, primarily because the Fall and Spring Sweepstakes had more impact on shoulder belt usage than the Winter Sweepstakes ($M = 25.8\%$, 23.4%, and 26.0% for Fall, Winter and Spring Sweepstakes, respectively). No main effect was found for Quarter, $p = .10$.

Taken together, the data from Sweepstakes 1, 2, and 3 indicate that each incentive intervention influenced an increase in follow-up shoulder belt usage. Shoulder belt usage remained higher than the initial Baseline usage even after the withdrawal of the incentive conditions; and these findings are

statistically as well as practically significant. Given 23,454 registered drivers on campus and an increase of 7.7 percentage points from Fall Baseline 1983 to Spring Withdrawal 1984, the program influenced an estimated 1800 individuals to begin buckling up on the Virginia Tech campus.

Insert Figure 3 about here

Figure 3 represents a breakdown of mean shoulder belt use according to subject classification: a) faculty/staff drivers, b) student drivers, and c) non-campus drivers. Due to a computer failure, a breakdown of Spring Baseline data according to type of driver was not possible. A regression analysis of the data indicated statistically significant increases in shoulder belt usage over the course of the study for faculty/staff, $F(1,149) = 29.87$, $p < .0001$; students $F(1,149) = 7.48$, $p < .01$; and non-campus drivers as well $F(1,149) = 13.34$, $p < .001$, with shoulder belt usage increasing 12.4%, 4.7%,and 6.3% from Fall Baseline to Spring Withdrawal for faculty/staff, student, and non-campus drivers, respectively.

Since a test for autocorrelation indicated no significant serial correlations between daily percentages for faculty/staff, $X^2(18, N = 176) = 16.10$, $p > .10$, students, $X^2(18, N = 176) = 17.63$, $p > .10$, and non-campus drivers, $X^2(18, N = 176) = 25.56$, $p > .10$, a 3 Quarter (Fall vs. Winter vs. Spring) X 3 Experimental Condition (Baseline vs. Intervention vs. Withdrawal) X 3 Type of Driver (Faculty/staff vs. Student vs. Non-Campus) ANOVA was performed. A main effect was found for Type of Driver, $F(2, 454) = 156.49$, $p < .0001$, showing faculty/staff drivers significantly more likely to buckle up (M = 27.7% usage) than either students (M = 18.9%), or non-campus drivers (M = 17.5%). A significant main effect was also found for experimental

condition, $F(2, 454) = 47.13$, $p < .0001$, indicating that drivers were more likely to buckle up during a Sweepstakes intervention ($M = 24.1$) than either Baseline ($M = 18.7\%$) or Withdrawal ($M = 22.0\%$). A statistically significant interaction was found for Experimental Condition and Type of Driver, $F(4, 454) = 3.56$, $p < .001$, indicating that Faculty/Staff drivers were more likely to buckle up as a function of the incentive condition than Student and Non-Campus drivers.

Table 1 summarizes the shoulder belt data, showing mean usage percentages for each experimental condition as well as mean shoulder belt use categorized according to type of driver (Faculty/Staff, Student, and Non-Campus drivers). In addition, mean shoulder belt usage percentages are shown for the Virginia Tech Police. The numbers in parentheses represent the frequences of observations per cell.

Insert Table 1 about here

Although a departmental policy requiring officer shoulder belt use had been put into effect prior to Fall Baseline, Baseline usage data showed that officers were unbuckled for almost 30% of the observations. Officers' shoulder belt usage increased substantially with the implementation of each Sweepstakes even though the officers were not eligible to win prizes. However, after the third withdrawal of the incentives, officer belt usage dropped to pre-program levels (i.e., 71.8% vs. 72.7% for Fall Baseline and Spring Withdrawal, respectively), indicating that the increase in officer safety belt wearing beyond the mandate impact was transient -- i.e., only apparent during program implementation.

Cost Effectiveness

Insert Table 2 about here

Table 2 summarizes: a) the costs of promoting the program, the costs incurred in soliciting prizes from merchants, the monies expended in distributing promotional materials, and the value of the prizes for Sweepstakes 1, 2 and 3; b) the percentage increase in shoulder belt usage for faculty/staff, students, and non-campus drivers for each quarter and for the entire year (i.e., from Fall Baseline to Spring Withdrawal); and c) the estimated number of newly buckled drivers per quarter and for the entire academic year.

The calculations for the program costs do not include the monies expended for program evaluation. The net program costs reflect the gross program costs minus the monetary value of the donated prizes. Adjustments refer to the dollar amount of the prizes donated to the program. The number of newly buckled drivers for each Quarter was estimated by calculating the percentage increase in usage from Baseline to Withdrawal within each Quarter and then multiplying this result by 235 (which is one percent of the number of drivers registered at Virginia Tech). The number of newly buckled drivers for the entire academic year was estimated by calculating the percentage increase in shoulder belt usage from Fall Baseline to Spring Withdrawal and multiplying this outcome by 235. The costs for each newly buckled driver were calculated by dividing the net total program costs for each time period (i.e., Fall, Winter, and Spring Quarters and for the entire academic year) by the number of newly buckled drivers for each time period.

As shown in Table 2, it cost an average of $1.22 for each new belt user

during the Fall quarter. For the Winter quarter, this cost fell to $1.05 per newly buckled driver and for the Spring quarter the cost was $1.56. When the number of newly buckled drivers is computed for the academic year (i.e., from Fall Baseline to Spring Withdrawal), it cost an average of $.98 per newly buckled driver. Of course, these costs would have been higher had the program not received support from the two Virginia Tech student organizations and the Blacksburg merchants. The *projected* costs shown in Table 2 are the costs of the program had the two student organizations not volunteered their time and the merchants not donated prizes. The projected costs for each newly buckled driver are $3.16, $1.78, and $3.25 for Fall, Winter, and Spring Quarters, respectively. For the entire academic year, the average projected cost is $3.19 per newly buckled driver.

In summary, the average cost per each newly buckled driver was quite small (especially when considering the costs incurred when a person is injured in an accident). Seatbelt Sweepstakes 2 was the most cost-effective in terms of dollars expended for each additional driver buckled up.

Telephone Surveys

Of the 2300 surveys planned, 1622 were administered. The interviewers were unable to reach the student for 591 of the 678 surveys that were not completed. Other questionnaires were not administered because the student reported no prior contact with the Police Department, and was therefore not requested to complete the interview. A 2 School (Virginia Tech vs. Radford University) x 2 (Driver vs. Nondriver) x 8 (Month of Interview), multivariate analysis of variance (MANOVA; Tatsuoka, 1971) was conducted on each of the three criterion measures (General Opinion, Value, and Competency). The analysis, using weighted means for unequal cell sizes, employed Wilk's lambda as the test for significance.

The MANOVA showed no significant main effects (all *p*s > .05); and the only significant interactions were for Month x Driver vs. Nondriver, $F(24,4432)=1.63$, $p = .03$, and Month x School, $F(21,4388)=1.69$, $p = .03$, which were largely due to the opinions of Radford University students' increasing most in favorability toward campus police. These findings were not surprising given that several rapes had occurred on the Radford University campus early in November, but by early Spring the rapist had been apprehended by the campus police. In sum, the MANOVA showed no statistically significant improvement in student attitudes toward Tech police as a function of the Seatbelt Sweepstakes. It is noteworthy, however, that opinions toward the police were quite favorable during each measurement session, (e.g., a mean composite score of 5.7 on a seven-point scale, with seven representing the maximum positive opinion).

By asking students at the end of the interview whether they had heard of the Seatbelt Sweepstakes, a measure of the students' awareness of the program was obtained. In general, students quickly became well informed of the program, with 78.4% of those interviewed during November indicating they knew of the program. By the end of Sweepstakes 3, over 90% had heard of the Sweepstakes and knew the specifics of its implementation.[4]

Police Questionnaire

In general, this survey indicated that the officers responded quite positively to their program-delivery responsibilities, indicating that administering the incentive intervention was not especially difficult for either their partner or themselves. In fact, the officers indicated, on the whole, that they would be willing to collect license plate numbers as part of their regular duties. The officers reported that their delivery of the Sweepstakes was a positive experience, and they indicated that the Virginia Tech students

were reacting in a more positive fashion toward the police, specifically as a result of the Seatbelt Sweepstakes.[5]

Parking and Moving Citations

A 3 (Work shift) X 3 (Quarter) X 3 (Experimental Phase) ANOVA for daily frequency of parking and moving citations indicated only a main effect for work shift, $F(2, 683) = 84.45$, $p < .0001$, with officers issuing an average of 50.7 tickets per day during the 7 a.m. - 3 p.m. work shift, 15.5 tickets per day during the 3 p.m. - 11 p.m. work shift, and an average of 7.1 tickets per day during the 11 p.m. - 7 a.m. work shift. The absence of any other effect suggests that the officers' daily issuance of speeding and parking tickets was not hindered by the delivery of the Sweepstakes.

Raffle Entries

In general, officers recorded a surprisingly large number of license plate numbers for each of the Sweepstakes. Specifically, the officers recorded 3,443 entries during Sweepstakes 1; 1,625 raffle entries during Sweepstakes 2; and 1,791 raffle entries during Sweepstakes 3. Because officers' raffle entries stabilized and remained high over the course of Sweepstakes 2 and 3 (despite the fact that they were no longer offered rewards for collecting license plate numbers during Sweepstakes 3), it appears that the officers accepted the implementation of the Sweepstakes as a part of their regular ongoing duties.

Discussion

The implementation of the Seatbelt Sweepstakes on the Virginia Tech campus increased shoulder belt usage significantly for university affiliated drivers as well as drivers not affiliated with Virginia Tech, and some belt usage was maintained after the withdrawal of the incentive programs. Although the mean gain in usage from Fall Baseline to Spring Withdrawal represented a 46% increase, the gains in belt wearing as a result of the

incentive conditions were not as large as those reported in other community-based attempts to motivate safety belt use. One possible explanation for this difference is that the data collectors in the present study were not the delivery agents (as in all other community-based safety belt programs), and thus, the observers in this study did not serve as reminders or discriminative stimuli to buckle up. It is also true that other communitywide incentive programs to promote safety belt use delivered more frequent and more valuable rewards than the present study (see review by Geller, 1984). Further, this difference may also be partially due to the relatively long-term nature of the present study. Indeed, the data collected during the Fall Quarter, which represents a duration comparable to most prior incentive programs for safety belt promotion (corporate or community-based), showed an impact equivalent to that of the more successful community incentive programs reported previously (cf. Geller, 1984).

The evaluation of the successive Sweepstakes showed a stepwise increase in shoulder belt usage over successive withdrawal periods. Analogous results were found in Canada with a disincentive approach to safety belt promotion. More specifically, Jonah, Dawson, and Smith (1982) showed successively greater compliance to a safety belt mandate as a function of periodic introductions of a "selective traffic enforcement program" (STEP), whereby the Canada seat belt law received a publicity and enforcement blitz.

Faculty and staff were much more likely to buckle up as a function of the campus incentive intervention than were either students or off-campus drivers. Although it is not surprising that non-campus drivers were not as likely to buckle up, the substantially lower program impact on students as compared to faculty and staff was unexpected and disappointing. There may be a number of possible explanations for this. For instance, drivers ages 16

to 24 are not as likely to buckle up as the rest of the driving population in general (Bragg & Finn, 1981), and thus a student population may be more resistant to attempts to motivate safety belt use.

The irregular driving schedule of university students may have contributed to the lower intervention impact of this group. Because classes are offered Monday, Wednesday and Friday, or on Tuesday and Thursday, or sometimes on only one day a week, a student may not drive to school everyday. Since students may not be driving on a regular basis, it may have been more difficult for them to establish a buckling-up habit.

During Fall Baseline, the campus police officers were observed buckled up almost five times more often than the rest of the campus. This high rate of belt usage was no doubt due to the pre-program implementation of a departmental mandate for safety belt use. During each Sweepstakes, however, officer usage increased significantly, even though officers were not eligible to win prizes for belt use. Apparently delivering a safety belt incentive program (with accompanying publicity) increased officers' personal commitment to wear a safety belt. Perhaps this increase in safety belt use was motivated by a need for behavioral consistency (e.g., it certainly would be dissonant to record license plate numbers of belt wearers without also wearing a safety belt). These results suggest that police may increase their belt usage when required to enforce a safety belt mandate. It is noteworthy, however, that the increase in safety belt use by the campus police was quite temporary, fading to initial baseline levels at the end of the school year (i.e., Spring Withdrawal).

A major consideration in the design of the police administered program reported herein, was the development of a cost effective easily-administered plan feasible for long-term application in various settings (e.g., other college

and university campuses or the community at large). The cost effectiveness analysis indicated that on a per capita basis, the program cost approximately one dollar for every newly buckled driver. It is noteworthy that the analysis used a measure of residual rather than full impact in computing program effectiveness (i.e., the cost effectiveness analysis was based on usage during Withdrawal rather than during the Sweepstakes), and therefore this measure was a conservative estimate of the program's impact. In addition, the $1,783 expended for the intervention implementation represents a very small investment for a program which can provide invaluable returns (i.e., the reduction of serious accident injuries or the saving of a life). Indeed, one graduate student credited the Seatbelt Sweepstakes with saving her husband's life, and recently a coed was uninjured when her pick-up truck rolled over three times because she was buckled up. This student claims that she had been wearing her safety belt because of the campus program.

One objective of the project was to enhance student's positive attitudes toward the Virginia Tech police. According to the telephone surveys, Tech students initially responded quite positively to questions regarding their perceptions of police competency, value, and general liking, and this attitude did not change significantly over the course of the study.

The police surveys indicated that, in general, the officers felt that delivering the safety belt program was a worthwhile experience and collecting license plate numbers was compatible with their standard daily responsibilities, since it did not interfere with their other ongoing duties. Perhaps the most significant finding of the police survey was that not only did officers indicate that students were responding more favorably toward them after the safety belt program was in place, but that this attitude improvement was attributed specifically to the Seatbelt Sweepstakes. This

suggests that implementing a safety belt incentive program can improve officers' perceptions of increased goodwill between the police department and the citizenry. A critical empirical question is whether this is also the case when police officers enforce safety belt mandates.

No prior studies investigated possible side effects when implementing a safety belt program. A statistical analysis of the parking and speeding violation data indicated no differences in ticket issuances between the Baseline, Sweepstakes and Withdrawal phases of the study. This permanent product data provided a reliability check for the officers' verbal reports that the Sweepstakes did not interfere with their regular ongoing duties, and this information also supported the long-term feasibility of a police-administered safety belt program. Commendable officer involvement in the safety belt program was also shown by the fact that the 22 full-time regular police collected nearly 7,000 raffle entries during the course of the study and raffle entries did not drop off during Sweepstakes 3, when officers were no longer offered incentives for collecting license plate numbers.

Perhaps the most positive outcome of the study was the fact that by the time of the third Sweepstakes, the program was almost entirely managed, promoted, and administered by the Virginia Tech Police and two student organizations. Indeed, plans are underway for a continuation of the program into the 1984/1985 academic year, with the campus police again delivering the program and the two student organizations handling promotion and coordination. In addition, the security officers of Wytheville Community College in Wytheville, Virginia and the police department in Sante Fe, New Mexico are currently implementing safety belt promotion programs which are modelled directly after the police-delivered Seatbelt Sweepstakes at Virginia Tech. Perhaps the enforcement of a state mandate to buckle up (as in New

York, beginning January 1, 1985) could be made more palatable to police and the public (with increased beneficial impact) if a police-administered incentive program for safety belt wearers were combined with the delivery of disincentives (i.e., monetary fines) for nonuse of safety belts.

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Author Notes

This research served as partial fulfillment for the first author's Master of Science degree from Virginia Polytechnic Institue and State University. The second author chaired the comittee, with other members being David A. Bownas, Lee W. Frederiksen, and Richard A. Winett. Preparation of this document was supported in part by Contract DTRS57683-C-0050 from the U.S. Department of Transportation and Contract DE84-5-58005 from the Virginia Division of Motor Vehicles. The authors gratefully acknowledge the assistance of Cheryl Bruff, Steven Clarke, Fifi Emami, Sandra Forrest, Phillip Maddox, James Nimmer, Agustin Reyna, Fritz Streff, Ann Talton and the Virginia Tech Police Department. Helpful support and advice were provided by Dr. Doug Gurin of the U.S. Department of Transportation and Police Chief Ray Lewis of Virginia Tech. Requests for reprints should be sent to E. Scott Geller, Department of Psychology, Virginia Tech, Blacksburg, Virginia, 24061.

Footnotes

[1]Details of the promotional aspects for the entire program are available from the second author upon request.

[2]A copy of the student telephone survey is available upon request to the second author.

[3]A copy of the police questionnaire is available upon request to the second author.

[4]Details of the results of the student telephone survey are available upon request to the second author.

[5]Details of the results of the police questionnaire are available upon request to the second author.

Figure Captions

Figure 1. A poster which described the specifics of the implementation of Seatbelt Sweepstakes 1. Large posters (11" x 15") were placed on bulletin boards throughout the university, and smaller versions (8" x 11") were located in classrooms and lecture halls.

Figure 2. Mean shoulder belt use for all drivers with best linear unbiased estimate. BL1 = Fall Baseline; SS1 = Seatbelt Sweepstakes 1; WD1 = Fall Withdrawal; BL2 = Winter Baseline; SS2 = Seatbelt Sweepstakes 2; WD2 = Winter Withdrawal; BL3 = Spring Baseline 3; SS3 = Seatbelt Sweepstakes 3; WD3 = Spring Withdrawal.

Figure 3. Mean daily shoulder belt use for faculty/staff, students, and non-campus drivers with best linear unbiased estimate. Due to a computer failure, a plot of Spring Baseline data according to type of driver was not possible.

Table 1

Mean Shoulder Belt Use During Baseline, Sweepstakes, and Withdrawal Periods

	FACULTY	STUDENTS	NON-CAMPUS	POLICE	OVERALL
BASELINE	19.3% (n=3284)	15.4% (n=4159)	15.6% (n=3750)	71.8% (n=196)	16.6% (n=11389)
SWEEPSTAKES 1	33.2% (n=2195)	23.9% (n=2867)	19.3% (n=2242)	87.2% (n=109)	25.8% (n=7413)
WITHDRAWAL	27.9% (n=2403)	18.7% (n=3088)	15.9% (n=2752)	79.5% (n=112)	20.4% (n=8355)
BASELINE	25.3% (n=2796)	16.5% (n=3515)	16.8% (n=4359)	72.8% (n=112)	18.9% (10782)
SWEEPSTAKES 2	31.7% (n=1872)	19.6% (n=2330)	20.8% (n=2809)	83.0% (n=62)	23.4% (n=7073)
WITHDRAWAL	29.9% (n=963)	20.6% (n=1432)	19.2% (n=1762)	84.0% (n=39)	22.3% (n=4196)
BASELINE	a	a	a	a	22.3% (n=10351)
SWEEPSTAKES 3	33.5% (n=2815)	21.4% (n=2893)	23.5% (n=3235)	78.5% (n=42)	26.0% (n=8985)
WITHDRAWAL	31.7% (n=1230)	20.1% (n=1112)	21.9% (n=1841)	72.7% (n=22)	24.3% (n=4205)

Note. Only those vehicle observations that included a notation of the availability of a parking sticker are included.
[a]During the Spring Phase, baseline data was not available for this categorization due to a computer failure.

Table 2
Cost Effectiveness Analysis for Seatbelt Sweepstakes

	Sweepstakes 1 Totals		Sweepstakes 2 Totals		Sweepstakes 3 Totals		Overall[f]	
	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
Gross Program Costs[a]								
Promotion	$515	$515	$389	$389	$365	$365	$1269	$1269
Merchant Solicitation[b]	280	91(80)	222	225(74)	251	3(72)	753	348
Promotion Distribution[c]	294	114(84)	224	52(64)	245	0(70)	763	166
Incentives	1730	1730	586	586	668	668	2984	2984
Total Gross Program Costs	$2819	$2450	$1421	$1252	$1529	$1065	$5769	$4767
Adjustments	$0	-$1730	$0	-$586	$0	-$668	$0	-$2984
Net Total Program Costs	$2819	$720	$1421	$666	$1529	$397	$5769	$1783
Number of Newly Buckled Drivers per Quarter[d]	893		799		470		1809	
Percent Increase in Shoulder Belt Usage[e]								
Faculty/Staff Drivers	8.6% (.30)		4.6% (.26)		1.8% (.34)		12.4% (.30)	
Student Drivers	3.3% (.39)		4.1% (.33)		-.5% (.33)		4.7% (.35)	
Off-Campus Drivers	.3% (.31)		2.4% (.41)		2.7% (.33)		6.3% (.35)	
Overall	3.8%		3.4%		2.0%		7.7%	
	Projected	Actual	Projected	Actual	Projected	Actual	Projected	Actual
Average Cost Per New Belt User	$3.16	$ .81	$1.78	$ .83	$3.25	$ .84	$3.19	$ .98

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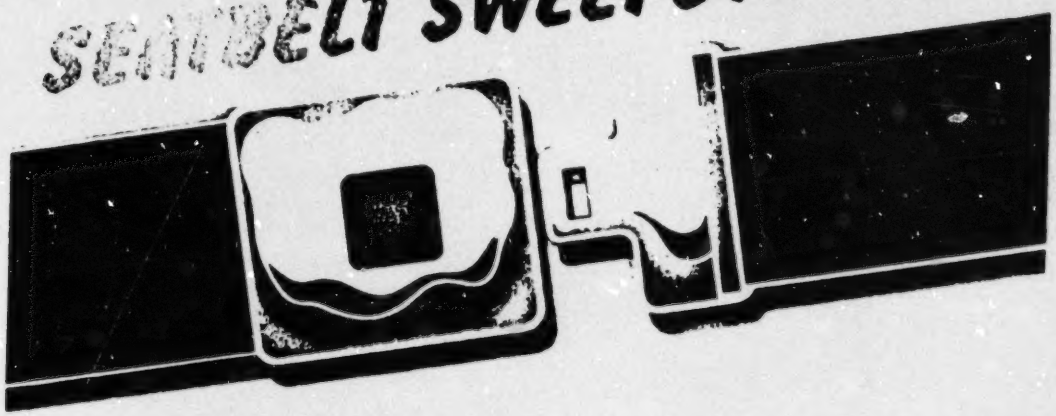
[a] Does not include costs of program evaluation.
[b] Number in parentheses denotes hours devoted to each component.
[c] Consisted of poster, flyer, and ticket distribution
[d] Calculated by estimating number of newly buckled drivers from change in average use during Baseline to Withdraw
[e] Number in parentheses denotes proportion of total observations represented by type of driver.
[f] Change in shoulder belt usage rate computed from Fall Baseline to Spring Withdrawal

BEST COPY AVAILABLE

BEST COPY AVAILABLE

TECH POLICE SAY
'Get Caught Buckled Up'
to enter
SEATBELT SWEEPSTAKES !



■ **Who?**

Anyone Driving on Campus

■ **When?**

November 1st until November 18th

■ **How?**

The Tech Police will record License No. of cars driven by belt wearers.

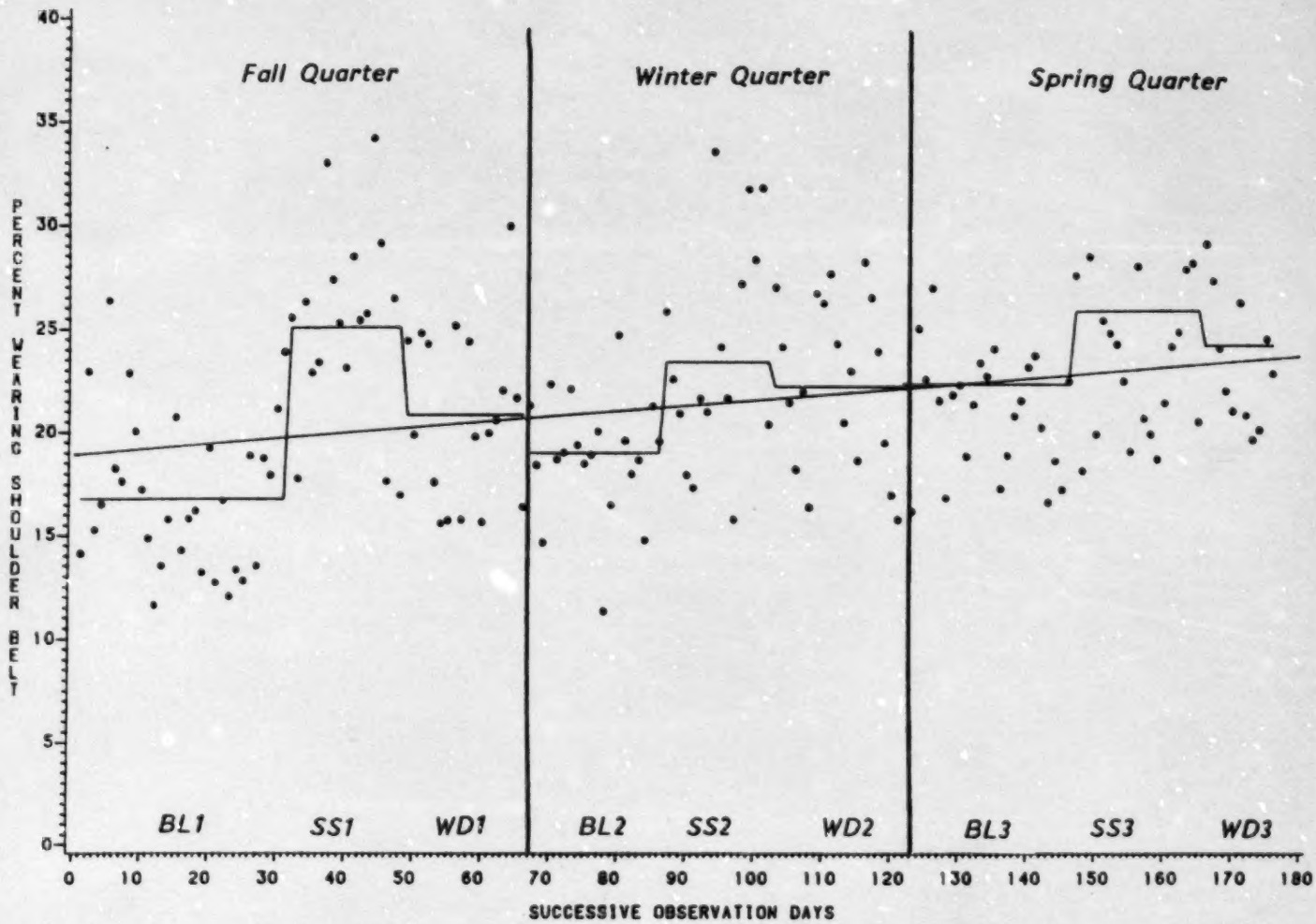
Get noticed by giving the "Seat Belt Salute."

■ **Why?**

$20 to $500 in prizes awarded to 10 raffle winners per week.

The more you are caught . . . the greater your chances to win.

Get in the habit of Buckling Up. If not for yourself, for someone you love . . .


Fall Quarter
Winter Quarter
Spring Quarter
PERCENT WEARING SHOULDER BELT
40
35
30
25
20
15
10
5
0
BL1
SS1
WD1
BL2
SS2
WD2
BL3
SS3
WD3
0
10
20
30
40
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70
80
90
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110
120
130
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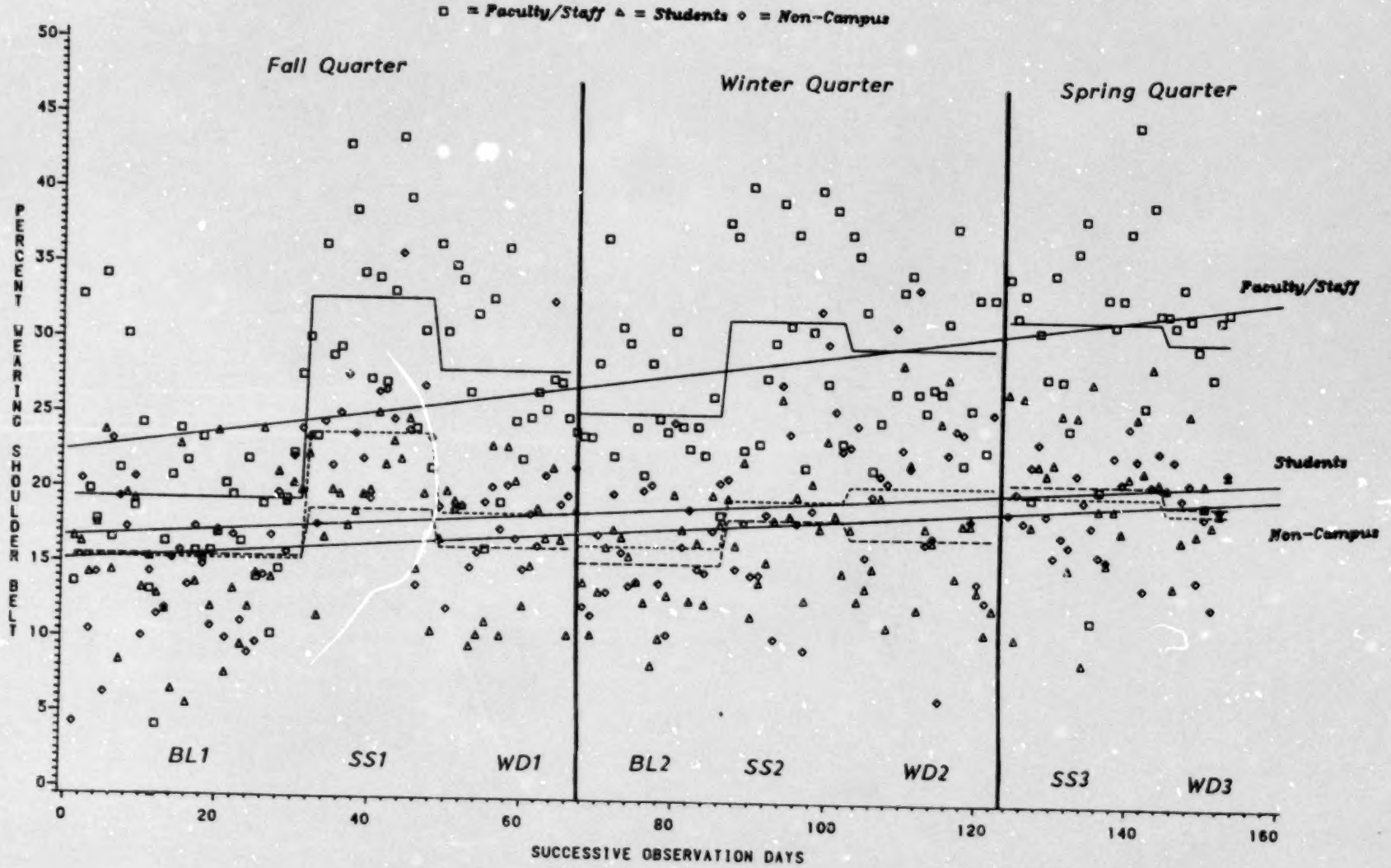
170
180
SUCCESSIVE OBSERVATION DAYS


□ = Faculty/Staff △ = Students ◇ = Non-Campus
Fall Quarter
Winter Quarter
Spring Quarter
PERCENT WEARING SHOULDER BELT
SUCCESSIVE OBSERVATION DAYS
Faculty/Staff
Students
Non-Campus
BL1
SS1
WD1
BL2
SS2
WD2
SS3
WD3
0
5
10
15
20
25
30
35
40
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50
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160